



Atty. Dkt. No. 046972-0102

***IN THE UNITED STATES PATENT AND TRADEMARK OFFICE***

Applicant: Davor PROTIC et al.  
Title: POSITION-SENSITIVE GERMANIUM DETECTORS HAVING  
A MICROSTRUCTURE ON BOTH CONTACT SURFACES  
Appl. No.: 10/511,734  
Int'l. Filing Date: 04/03/2003  
371(c) Date: 10/18/2004  
Examiner: Shun K. LEE  
Art Unit: 2884  
Confirmation No.: 2536

**PRE-APPEAL BRIEF REQUEST FOR REVIEW**

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Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

Sir:

This communication is a request for a pre-appeal brief review under the Pre-Appeal Brief Conference Pilot Program (1296 OG 67) responsive to the Final Office Action dated April 15, 2008, concerning the above-referenced patent application.

**Succinct Argument for Panel Review**

Pending claims 1 and 3-12 currently stand rejected under 35 U.S.C. § 103(a) over Hammacher, *et al.*, “Performance of position-sensitive Germanium Detectors in Nuclear Reaction Experiments Nuclear Instruments & Methods in Physics Research, Vol. A295, no. 1-2 (October 1990), (“Hammcher”) in view of Luke, *et al.*, Amorphous Ge Bipolar Blocking Contacts on Ge Detectors, IEEE Transactions on Nuclear Science, Vol. 39, No. 4 (August 1992), pp. 590-594 (“Luke”). Claim 8 is also rejected under 35 U.S.C. § 112 ¶1.

Applicants submit that the application should be allowed for two reasons. First, the Examiner improperly discounted the evidence of non-obviousness contained in the declaration of Davor Protic, submitted January 31, 2008. Second, if the declaration of Protic and supporting references are considered, it is clear that motivation to combine the Hammacher and Luke references did not exist. In fact, there was an active belief that the use of an amorphous Germanium layer as part of a contact would reduce the energy resolution of the detector. It was only through the Applicants’ teaching of a *structured* amorphous Germanium layer that the surprising increase in energy resolution was revealed.

**The Declaration Of Protic Was Improperly Discounted**

In the Office Action mailed April 15, 2008, the Examiner discounted the declaration of Davor Protic, stating on page 6:

The declaration under 37 CFR 1.132 filed 31 January 2008 is insufficient to overcome the rejection of claims 1 and 3-12 based on Hammacher *et al.* in view of Luke *et al.* as set forth in the last Office action because it refers only to the system described in the above-referenced application and not to the individual claims of the application. Thus, there is no showing that the objective evidence of non-obviousness is commensurate in scope with the claims. *See* MPEP § 716.

The Examiner’s reasoning appears to be referring to the requirement of “nexus” between certain evidence of non-obviousness and the claims of an application. In some instances, it is appropriate for the Office to require a nexus between the claims and the evidence, in order to ensure that the evidence is relevant to the question of obviousness. For example, if an applicant presents evidence of the commercial success of a product

incorporating an invention, it is appropriate to require evidence that the claimed features produced the success, as opposed to a good marketing campaign.

In the present case, however, the declaration of Protic was not submitted to present this type of evidence. Instead, it was presented to rebut the particular motivation to combine Hammacher with Luke put forward by the Examiner. Specifically, the Examiner reasoned that a person of skill in the art would combine Hammacher with Luke in order to provide Hammacher with a good blocking contact. The declaration of Protic responds to this specific finding, providing evidence that (1) such motivation did not exist, *see* ¶¶ 5-8, and (2) that there was an belief that the use of amorphous Germanium would degrade the energy resolution of a detector, *see* ¶¶ 11-12.

Thus, the Protic declaration is directly tied to the Examiner's reasoning. Applicants respectfully submit that, if the Protic declaration is not relevant to the claims under examination, then neither is the Examiner's motivation to combine references.

#### **No Motivation To Improve Blocking Contact**

The Examiner combined Hammacher with Luke, reasoning that a person of skill in the art would be motivated to provide Hammacher with a good blocking contact. However, as explained by Mr. Protic, the Boron-doped contact of Hammacher already provides an excellent contact. *See* Protic Decl. ¶¶5, 6, 8 and 11-12.

As explained by Mr. Protic, the following features are of interest with regard to a detector:

- Of importance is the accuracy in the energy measurement.
- Of importance is to provide a detector with a good energy resolution in the measurement.
- Of importance is to provide a durable detector.
- It is often of importance to provide a detector with a good positional resolution.

*See* Protic Decl. ¶7.

Typically, blocking contacts are provided to reduce the leakage current, which can affect the energy resolution of the device. *See* Protic Decl. ¶9. At temperatures where

Germanium detectors are used commercially, however, the leakage current of a detector is quite small. *See* Protic Decl. ¶10. There is therefore no motivation to provide better blocking contacts for these sorts of detectors, because doing so will not improve the energy resolution. *See* Protic Decl. ¶10.

As further evidence of this, Applicants submitted as Attachment 2 to their January 31, 2008 supplemental response a newer article by Luke, with the citation M. Amman, P.N. Luke, S.E. Boogs, NUCLEAR INSTRUMENTS AND METHODS IN PHYSICS RESEARCH A 579 (2007) 886-890 (“Luke II”).

According to this article, page 887, left column, paragraph 1, Luke teaches:

The standard contact technology for such a detector consists of a Li-diffused n+ contact and a B-implanted p+ contact. Both contact types are robust, can withstand high electrical fields, and lead to a low charge carrier injection.

The phrase “[l]ead to a low charge carrier injection” means that the leakage current is small.

Moreover, Hammacher itself makes no reference to the Boron contact as a blocking contact, nor does it express any desire for a better blocking contact than Boron.

**Amorphous Germanium Was Believed To Decrease Energy Resolution**

There was further no motivation to combine Hammacher with Luke at the relevant point in time, because a person of ordinary skill in the art would have expected an amorphous Germanium contact to decrease the energy resolution of the device.

As explained by Mr. Protic, experiments carried out by others with a contact of structured metal on top of an unstructured, amorphous Germanium layer resulted in a relatively poor energy resolution. *See* Protic Decl. ¶¶ 11-12; see also top of page 5 of present application. Thus, the person of ordinary skill in the art would have had no incentive to combine Hammacher with Luke. He or she would have expected that the replacement of Boron-doped contacts with amorphous Germanium contacts would have decreased the energy resolution of the device, while not appreciably decreasing the leakage current over the already good Boron-doped contact.

The present application differs from the prior art at least in that it teaches the use of a structured amorphous Germanium layer. In reality, a person of skill in the art would have had no basis to believe that there would be any significant difference between a structured or unstructured amorphous Germanium layer. Since the person skilled in the art expected a poor energy resolution with the use of an unstructured layer for the above mentioned reasons, it was not obvious for a person skilled in the art that the subject matter of claim 1 would lead to a detector with a significantly improved energy resolution. It is believed that a structured amorphous Germanium layer was first used by the present inventors, and that the surprising benefits of this feature were unknown to a person of skill in the art at the time the invention was made. See Protic Decl. ¶ 12.

**Rejection of Claim 8 Under 35 U.S.C. § 112 ¶1**

Claim 8 was also rejected under 35 U.S.C. § 112 ¶1. Applicants incorporate by reference their remarks on this rejection made in the October 31, 2007 submission.

**Summary**

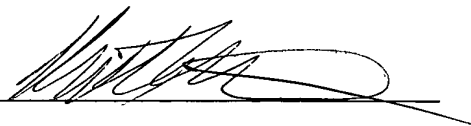
Applicants respectfully submit that the claims should be allowed, because there is no case of non-obviousness under 35 U.S.C. § 103(a). When the evidence as presented in the Protic declaration is properly taken into account, there is no motivation to combine the Hammacher and Luke references. In fact, there was an active belief that the use of amorphous Germanium would lead to decreased energy resolution.

Respectfully submitted,

Date

8/15/2008

By



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